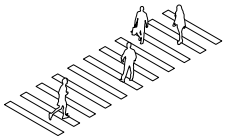

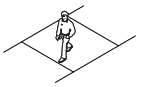

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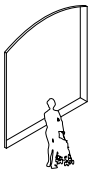
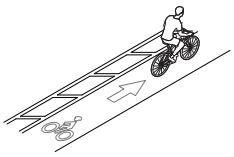
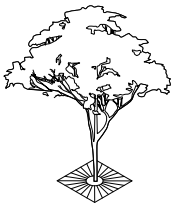
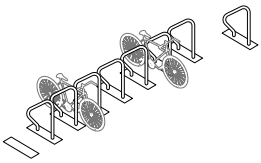
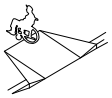

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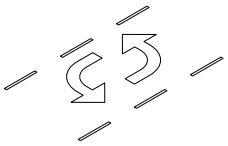
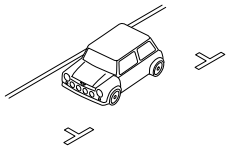
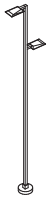
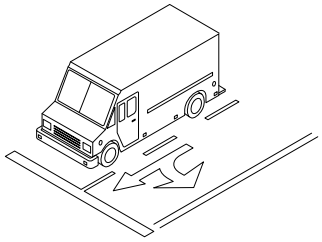

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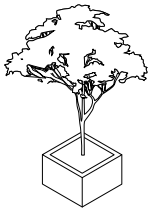
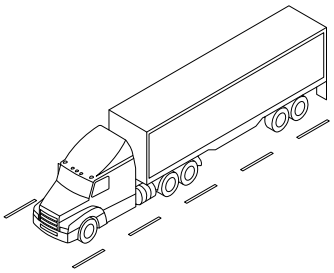
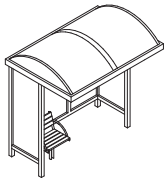
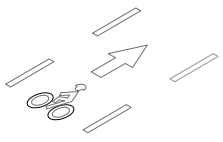
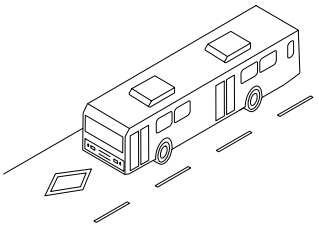
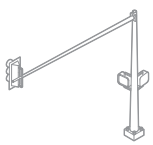
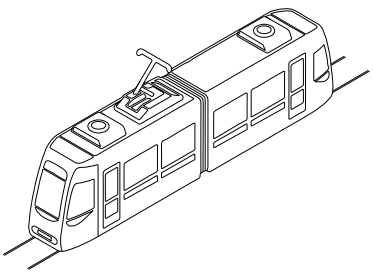







CIVIL AND ENVIRONMENTAL ENGINEERING
SPRING 2022, CEVE 452 002
URBAN TRANSPORTATION SYSTEMS
TUES | THURS, 8:00 - 9:20 A.M.
INSTRUCTOR CHRISTOF SPIELER
INSTRUCTOR MANDI CHAPA

INTRODUCTION

Transportation is probably the biggest driver of the shape of our cities. Cities exist because they are the best mechanism humans have developed for bringing people together. The more people meet, the more they develop ideas, grow organizations, build culture, and trade.

Cities developed as we went from designing for pedestrians to designing for trains and streetcars to designing for cars. Now, the shape of cities is evolving again, as we try to design "complete streets" that accommodate pedestrians, bikes, and transit. All of this is a continuing discussion between engineers, planners, and architects. Engineers take the lead in designing transportation, however you cannot design good transportation infrastructure without thinking of planning, architecture, and urban design.

The key to understanding any mode of transportation, is understanding its geometry. The geometry of trains — their length, the curve radii and grades they require — drove the design of the Victorian City. The geometry of cars — lane widths, intersection layouts, and highway grade separation — drives the design of today's cities. On a large scale, transit depends on the geometry of networks and connections. The design standards, such as the AASHTO Green Book, sets this geometry, and are essentially the DNA of the urban landscape.

We cannot understand transportation with being comprehensive in terms of modes: roadways, pedestrians, bikes, transit, planes, shipping, and freight, as well as passengers. That includes thinking about how these modes interface and work with one another, since that is increasingly the way the world works. A container going from a factory in China, to a warehouse in Texas, moves from truck, to ship, to truck, to train, to truck, but to the shipper it is all a one-supply chain.

In this semester, we will look at the history of transportation modes in the context of the history of cities. We will look at how we conceive and implement transportation infrastructure. We will visit some local transportation infrastructure. But, this is at heart a design class. It is not possible to, in one semester, become a traffic engineer. It is possible however, to learn enough about roadway design to, given a specific right-of-way width, come up with a few alternate cross sections for a road and analyze the pros and cons of each. It is possible to learn enough about how a rail station works to lay out a set of tracks and platforms and think about how to fit them into a city.

CLASS MEETINGS AND LOGISTICS

To start the semester, class meets on online on Zoom Tuesdays and Thursdays, from 8:00 - 9:15 a.m.
https://riceuniversity.zoom.us/j/92157385449
passcode: 387614

CLASS OUTLINE AND LEARNING OBJECTIVES

Introduction: Transportation and Cities Pedestrians
Bicycles
Cars and Trucks
Trains
Transit Networks
Ships
Planes
Conclusion: Organizations, Engineers, Planners, and Architects

Upon completion of this sequence, a student is expected to:
- Understand the fundamental characteristics of the most common transportation modes
- Understand the role different transportation modes serve today
- Understand how the design of transportation systems shapes cities
- Be able to sketch "back of the envelope" designs for pedestrian, bicycle, and car and truck infrastructure, and transit networks
- Be aware of the systems by which transportation projects are designed, funded, built, maintained, and operated in the United States

ASSIGNMENTS

There will be homework assignments through the semester. Assignments will include writing, graphic documentation, and oral presentation. Assignments will be graded for writing and presentation, as well as for content.

There will be two kinds of assignments:
- A transportation autobiography, which every student must complete
- Transportation audits. There are 5 of these (walk, bike, drive, transit, and fly) and each student must complete two of the five audits and present them in class. There is a limited number of presentation slots, and each presentation day is limited to specific audits. Students can sign up for presentation slots on Canvas, and should sign up as soon as possible to ensure they have the audits of their choice.

The transportation audits involve going off campus, which will involve risks that sitting in a class on campus does not. Audits will involve physical activity, including walking and bicycling. They will also require students to navigate the city by themselves. A release form will be required. Any student who is not comfortable with a particular audit should select a different audit. Students participate at their own risk, and neither Rice nor the instructors are responsible for student safety.

Assignments cannot be re-submitted; the first submission on Canvas is final. Assignments not submitted on time will be penalized.

FINAL PROJECT

A final project will be assigned early in the semester and will be due at the end of the semester.
There will be three deadlines:
A rough draft "memo"
A presentation to the class
A final report
All three will be graded

EXAM

There will be no exams for this semester.

IN-CLASS DESIGN EXERCISES

Group design activities will be scheduled during the regular class time.

FIELD TRIPS

Field trips will be scheduled outside of regular class times. Students will receive extra credit equivalent to 1% of the total course grade for each field trip they attend.

By their nature, field trips involve going off campus, which will involve risks that sitting in a class on campus does not. Field trips will involve physical activity, including walking and bicycling. Some field trips may have off-campus meeting points and require students to navigate the city by themselves. A release form will be required. Any student who is not comfortable with a field trip should not take part. Students participate at their own risk, and neither Rice nor the instructors are responsible for student safety.

Students can also get extra credit by doing one of two things:
- Attending an off-campus lecture or talk on a transportation topic and then submitting a few paragraphs on Canvas about the event and what you found interesting or learned. Each lecture counts for extra credit equivalent to 1% of the class grade. On-campus lectures targeted at the greater Houston community (such as Kinder Institute) may also be eligible for credit; email the instructors in advance to see if they will qualify.
- Attending a public meeting about a transportation project, and then submitting a few paragraphs on Canvas (about the event and what you found interesting or learned.) Each event counts for extra credit equivalent to 1% of the total class grade.

Students may receive extra credit for up to 3 field trips and /or events, up to 3% total.

TEXT BOOKS

The following texts are assigned for the class. Students are expected to read and be prepared to discuss the reading in class.

"Walkable City: How Downtown Can Save America, One Step at a Time," Jeff Speck, 2013 (http://amzn.com/0865477728)

"Divided Highways: Building the Interstate Highways, Transforming American Life," Tom Lewis, 2013 (http://amzn.com/0801478227)

"Human Transit: How Clearer Thinking about Public Transit Can Enrich Our Communities and Our Lives," Jarrett Walker, 2011 (http://amzn.com/1597269727)

Texts may be purchased on Amazon or other booksellers in paper or e-book format.
In addition, two books are available online, but can be purchased by anyone who wants a hard copy:

"Urban Street Design Guide," NACTO, 2013, available at https://nacto.org/publication/urban-street- design-guide/ (https://www.amazon.com/Street- National-Association-Transportation-Officials/dp/1610914945)

"Trains, Buses, People," Christof Spieler, 2021. Excerpts will be posted. (https://www.amazon.com/Trains-Buses-People-Opinionated-Transit/dp/1610919033)

GRADING

All assignments, as well as class attendance and participation, will be graded with + | - letter grades, and the total class grade (also in + | - letter grades) will be calculated based on the following weighting:

10% Class attendance and discussion
30% Audit Assignments (2)
60% Final Project (1)
Late assignments and projects drop one letter grade.

ATTENDANCE | ABSENCE POLICY

Attendance is required and we expect active participation. Accommodations may be made for illness or academic-related absences. If you are unable to attend class due to illness or other conflict, email both of us in advance of the class time to let us know you will not be in class. In the email, use "Absence" in the subject line.

The attendance portion of the class will be graded as follows:
3 or fewer absences - Full credit
4, 5 or 6 absences - 50% credit
More than 6 absences - No credit

CONTACTING US

Christof can be reached at spieler@rice.edu and | or at (832) 687-1613

Mandi can be reached at mandi.chapa@rice.edu and | or at (281) 650-8371

We are happy to schedule a Zoom call with any one of you anytime, e-mail us to schedule. We do not have an on-campus office.

If, due to COVID, you are in a time zone for which the class meeting times are inconvenient, we can make some accommodations. Please let us know and we will discuss.

HONOR CODE

The extent of collaboration permitted on each assignment, project, and exam will be indicated with that assignment, project, or exam. The link to the Rice University website is http://honor.rice.edu/honor-system-handbook/

ACCOMMODATIONS FOR DISABILITY

Any student with a documented disability seeking academic adjustments or accommodations is requested to speak to the instructor during the first two weeks of class. All such discussions will remain as confidential as possible. Students with disabilities will need to also contact Disability Support Services in the Allen Center. The link to the Rice website is https://drc.rice.edu

PREREQUISITES

This class is open to students of any major. There are no prerequisites.